

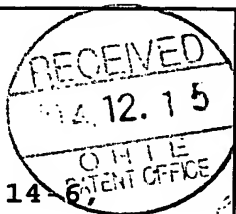
# PATENT COOPERATION TREATY

From the  
INTERNATIONAL SEARCHING AUTHORITY

To:

**OHIE Kunihisa**

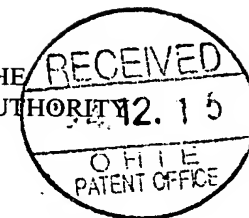
**OHIE PATENT OFFICE**  
**Selva-Ningyocho 6F, 14-6,**  
**Nihonbashi-Ningyocho**  
**2-chome, Chuo-ku, Tokyo**  
**103-0013 JAPAN**



## PCT

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

(PCT Rule 43bis.1)



Date of mailing  
(day/month/year) **14.12.2004**

Applicant's or agent's file reference

**SDF-5027PCT**

**FOR FURTHER ACTION**

See paragraph 2 below

International application No.

**PCT/JP2004/011028**

International filing date (day/month/year)

**27.07.2004**

Priority date (day/month/year)

**28.07.2003**

International Patent Classification (IPC) or both national classification and IPC

Int.Cl.<sup>7</sup> **H01M 4/02, H01M 4/62, H01M 4/58, H01M 4/48, H01M 10/40**

Applicant

**SHOWA DENKO K.K.**

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☐ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☒ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. FURTHER ACTION

If a demand for international preliminary examination is made, this opinion will be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA/JP

**Japan Patent Office**

3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan

Authorized officer

**Hitoshi AMANO**

Telephone No. +81-3-3581-1101 Ext. 3477

**4X**

**9151**

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/011028

Box No. I      Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ This opinion has been established on the basis of a translation from the original language into the following language \_\_\_\_\_, which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

a. type of material

- ☐ a sequence listing  
☐ table(s) related to the sequence listing

b. format of material

- ☐ in written format  
☐ in computer readable form

c. time of filing/furnishing

- ☐ contained in the international application as filed.  
☐ filed together with the international application in computer readable form.  
☐ furnished subsequently to this Authority for the purposes of search.

3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

**WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY**

International application No.

**PCT/JP2004/ 011028**

**Box No. V** Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

**1. Statement**

Novelty (N)	Claims	<u>1 - 34</u>	YES
	Claims	<u>35 - 37</u>	NO
Inventive step (IS)	Claims		YES
	Claims	<u>1 - 37</u>	NO
Industrial applicability (IA)	Claims	<u>1 - 37</u>	YES
	Claims		NO

**2. Citations and explanations**

D1 : EP 1191131 A1 (SHOWA DENKO K. K.) 2002.03.27  
D2 : JP 10-027601 A (SANYO ELECTRIC CO LTD) 1998.01.27  
D3 : JP 2001-015170 A (SONY CORP) 2001.01.19  
D4 : JP 05-174820 A (FUJI PHOTO FILM CO LTD) 1993.07.13  
D5 : JP 10-284055 A (MITSUBISHI ELECTRIC CORP), 1998.10.23  
D6 : JP 2001-196052 A (SONY CORP), 2001.07.19  
D7 : JP 07-211320 A (YUASA CORP), 1995.08.11  
D8 : JP 11-329433 A (KAO CORP), 1999.11.30  
D9 : JP 2000-195550 A (TOSHIBA CORP), 2000.07.14  
D10: JP 11-149824 A (SHOWA DENKO K. K.), 1999.06.02

The subject matters of claims 1-34 do not appear to involve inventive steps in view of the D1-10. D1-8 disclose lithium battery electrodes comprising electrode active substances and fine carbon fibers, and D8 and D9 teach preferable range of porosity of lithium battery electrodes in order to obtain batteries with high capacity and strength. Therefore, the person skilled in the art would regard it as a normal option to optimize the range of porosity of the electrodes in D1-D8 in order to obtain a high capacity and strength. Moreover, since secondary batteries with non-aqueous polymer electrolyte are generally known, as is disclosed in D7, D8 and D10, the person skilled in the art would easily conceive the idea of applying non-aqueous polymer electrolyte to the batteries disclosed in D1-D8.

The subject matters of claims 35-37 do not appear to involve novelty and inventive steps in view of the D1. D1 discloses lithium battery electrodes having a capacity density of 100 mAh/g or higher (see Example-7 & 8). Although D1 does not show the electrolytic solution permeability of the electrodes, taking into account of their structures and capacities, there is a high probability that the electrodes have high permeation rate.

WRITTEN OPINION OF THE  
INTERNATIONAL SEARCHING AUTHORITY

International application No.

PCT/JP2004/ 011028

Box No. VI Certain documents cited

1. Certain published documents (Rules 43bis.1 and 70.10)

<u>Application No. Patent No.</u>	<u>Publication date (day/month/year)</u>	<u>Filing date (day/month/year)</u>	<u>Priority date (valid claim) (day/month/year)</u>
JP 2003-223896 A [E, Y]	08.08.2003	31.01.2002	
JP 2004-220909 A [E, A]	05.08.2004	15.01.2003	
JP 2004-220910 A [E, A]	05.08.2004	15.01.2003	

2. Non-written disclosures (Rules 43bis.1 and 70.9)

<u>Kind of non-written disclosure</u>	<u>Date of non-written disclosure (day/month/year)</u>	<u>Date of written disclosure referring to non-written disclosure (day/month/year)</u>
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**Box No. VIII Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

1. The features of claims 3, 8, and 25-29 are not sufficiently supported by the description for the following reason: the description does not have illustrative examples including the above features, and such features used for the electrodes with fine carbon fibers are not well known for the person skilled in the art.
2. The subject matter of the claim 31 is not clear, due to lack of the electrode size. Time for absorption should be defined with the size of a unit electrode.